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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/723,942 | 11/26/2003 | Hibiki Saeki | SIW-074 | 9424 |

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| EXAMINER | |
|---|---|
| NGUYEN, CUONG H | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3661 | |

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/723,942 | SAEKI ET AL | |
| | Examiner | Art Unit | |
| | CUONG H. NGUYEN | 3661 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-3* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. This Office Action is the answer to the amendment received on 4/04/2005.

2. Claims 1-3 are pending in this application, wherein claim 3 is newly added.

### *Priority*

3. Acknowledgment is made of applicants' claim for foreign priority based on JPO 2002-347148, 11/29/2002.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

4. **Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (US Pat. 6,458,478), in view of Yamaguchi et al. (US Pat. 6,480,767 B2), and further in view of Mercuri et al. (US Pat. 6,521,369).**

A. As for independent claim 2: Wang et al. teach a system for electric-powered vehicle using a fuel cell (see Wang et al., the abstract), comprising:

a. a propulsion motor capable of driving a vehicle (see Wang et al., col. 1 lines 4-9);

b. a fuel cell which generates electric power by supplying a reactant gas to give an electrochemical reaction (see Wang et al., claim 6);

c. a capacitor which stores generated energy of said fuel cell and performs transfer of electrical energy with said propulsion motor (see Wang et al., Fig.1 – ref. 101, and claim 3 obviously suggests a stored energy of a fuel cell (a capacitor is a device to store electrical energy) and transferring of electrical energy);

- a reactant gas supply device which supplies said reactant gas to said fuel cell (see Wang et al., Fig.1 shows a schematic diagram with 2 water-gas shift reactors);

d. a reactant gas supply device which supplies said reactant gas to said fuel cell (see Wang et al., Fig.1 shows a schematic diagram with 2 water-gas shift reactors); and

e. an output control device which controls an output current of said fuel cell (see Wang et al., Fig.1 ref.10 – a thermoelectric reformer allows quick response to transient loads;, or see Yamaguchi et al. col. 48 lines 35-60 wherein output current is controlled/calculated by a device);

f. a device to detect a pressure of said reactant gas (see Wang et al., claim 10);

Wang et al., do not expressly disclose that:

g. a device to calculates an electric power which can be generated by regenerative operation; however, Yamaguchi et al. obviously suggest that device (see Yamaguchi et al., col.5 lines 54-65, or col. 48 lines 35-60);

h. a device which calculates a chargeable power which can be charged to capacitor; however, Yamaguchi et al. obviously suggest that device (see Yamaguchi et al., 6:33-42); and

i. in case where a chargeable power is less than a regenerative electric power in a gas pressure environment, said reactant gas supply device stops supply of said reactant gas to the oxygen electrode of said fuel cell, and said output control device restricts the value of the output current of said fuel cell to substantially zero, and

As best understood, the examiner presumes this following condition does not happen since there is a conflict when using the word "and" in this limitation (2 opposite physical conditions can not happen simultaneously):

j. in the case where said chargeable power is greater than said regenerative electric power, and said chargeable power is less than said regenerative electric power and the pressure of said reactant gas at the fuel electrode of said fuel cell is greater than a predetermined pressure, said output control device cancels the restriction on the output current of said fuel cell.

The limitation in i. is well-known in electrical field because a chargeable power is compared to a threshold in the existence of a gas pressure (a regenerative electric power which is a predetermined number) to control a flow of output current (allowing a forward or reverse electron direction from the different of voltages between 2 points), for this condition, only having a flow of current toward a fuel cell for charging).

- For condition i., a fuel cell outputs current if it draws negative current (i.e., chargeable power calculating device, and the conditions of output currents according to a relationship of chargeable power and regenerative power as recommended by Yamaguchi et al. for the benefits of implementing a better controllable and chargeable fuel cell.

o Wang et al. and Yamaguchi et al. do not disclose that fuel cell units are formed by sandwiching an electrolyte membrane between a fuel electrode and an oxygen electrode.

o However, Mercuri et al. suggest that idea (see Mercuri et al. col.1 lines 27-50, and col.10 lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Wang et al., and Yamaguchi et al. to disclose a device to calculates an electric power which can be generated by regenerative operation; and a device which

calculates a chargeable power which can be charged to capacitor for independent calculate the regenerative power and a chargeable power to a fuel cell for flexible controls

B. As for independent claim 1:

Because the above rationales for obviousness rejection of independent claim 2 also covers all limitations of claim 1 (including additional limitations of claim 1), similar rationales and references set forth are also applied for 35 USC 103(a) rejection.

C. As for dependent claim 3: Previous Office Action already covers all claim 2 's limitation including a limitation of new claim 3 (forming by deleting a limitation of old claim 2). Therefore, Wang et al., Yamaguchi et al., and Mercuri et al. also suggest an apparatus for controlling a fuel cell, wherein said output control device cancels the restriction on the output current of said fuel cell when:

i. chargeable power is less than the regenerative electric power; and

ii. the pressure of reactant gas at the fuel electrode of said fuel cell is greater than a predetermined pressure.

The examiner respectfully submits that those above 2 conditions for outputting current of a fuel cell are obvious.

- For condition i., a fuel cell outputs current if it draws negative current (i.e., chargeable power is less than the regenerative electric power – this is a principle of electric charges).

- For condition ii., a pressure of reactant gas is greater than a predetermine pressure (i.e., gas pressure has a tendency of moving from a high pressure point to a lower point.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Wang et al., Yamaguchi et al., and Mercuri et al. to disclose a pressure of reactant gas is greater than a predetermine pressure in addition to a

requirement of a chargeable power is less than the regenerative electric power to accurately decide a generative or regenerative status of a fuel cell.

***Response***

5. The examiner withdraws the previous ground of rejection due to the amendment on 4/04/05 for new grounds of rejections. The arguments are moot.

***Conclusion***

6. Claims **1-3** are not patentable. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CUONG H. NGUYEN whose telephone number is 571-272-6759. The examiner can normally be reached on 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, THOMAS G. BLACK can be reached on 571-272-6956. The Rightfax number for the examiner where this application is assigned is 571-273-6759.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CUONG H. NGUYEN
Primary Examiner
Art Unit 3661